Navy's Proposed Clarifications to Regulatory Option #2

1. **Adopt Federal Standards for consistency in Release Criteria**
   Develop site specific DCGLs using EPA's PRG Calculator based on the release criterion of 3x10-4 excess lifetime cancer risk (the equivalent of 12 millirem/year TEDE) found in EPAs OSWER 9385.6-20 (June 13, 2014). Please see Table 1.

2. **Apply all facets of MARSSIM to ensure compliance with the DCGLs**
   i. Step 1: Treat each survey unit as a whole rather than comparing individual sample results to the $DCGL_W$.
      1. Collect appropriate number of systematic samples
      2. Use Wilcoxon Rank Sum or Sign Test to determine if residual activity of the survey unit exceeds the release criterion
   ii. Step 2: Search for small areas of elevated activity
      1. Perform a surface gamma walkover survey
      2. Collect biased samples based on gamma survey
      3. Compare biased (and systematic) samples to $DCGL_{EMC}$
   iii. Step 3: Use Unity Rule to determine whether the combined risk from all ROCs exceeds the release criterion ($3x10^{-4}$)

3. **Define "Reasonable Effort" under the California Code of Regulations as meeting the updated release criteria through the application of MARSSIM**

4. **"Failure" will be defined as described in #2 above and will exclude potential discoveries of discreet radiological items, such as deck markers, that are found beyond the previous excavation boundaries.**
   The Navy will remove and properly dispose of any such discoveries.

Table 1 - Comparison of Current Action Memo Values with Site-Specific Calculated DCGLs

Radionuclide	Current $DCGL_w$ (pCi/g)	Proposed $DCGL_w$ (*PRG Calculator* at $3x10^{-4}$ ELCR) (pCi/g)	Proposed $DCGL_w$ (*RESRAD* at $3x10^{-4}$ ELCR) (pCi/g)	Associated TEDE from Proposed $DCGL_w$ (mrem/yr)
Cs-137	0.113	13.7	17.4	12
Ra-226	1(+background)	3.9	3.9	12
Sr-90	0.331	1170	1497	12
Pu-239	2.59	59.1	58.8	12

DCGL: Derived Concentration Guideline Level is the amount of a specific radionuclide in a defined volume of material that will cause a pre-determined dose to an individual equivalent to the release criterion.

$DCGL_{EMC}$: DCGL (Elevated Measurement Comparison) is the $DCGL_W$ multiplied by an Area Factor (AF). The AF represents the magnitude by which the concentration within the small area of elevated activity can exceed the $DCGL_W$ while maintaining compliance with the release criterion (i.e., $3x10^{-4}$ ELCR).

$DCGL_w$: DCGL (Wilcoxon Rank-Sum (WRS)) is derived based on an assumed average concentration of activity from a specific radionuclide over a large area. This value is used in statistical tests to determine if a survey unit, as a whole, exceeds the release criterion.

ELCR: Excess Lifetime Cancer Risk is the increase in the likelihood of an individual getting cancer in his or her lifetime due to a long term (26 year (EPA default value)) exposure to a contaminant.

TEDE: Total Effective Dose Equivalent is the sum of the doses to an individual from external and internal sources of radioactivity, thereby taking into account all exposure received from a radioactive source.